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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/927,175	08/10/2001	Robert A. DiChiara JR.	7784-000171	4647

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EXAMINER

BARR, MICHAEL E

ART UNIT PAPER NUMBER

1762

DATE MAILED: 04/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/927,175

Applicant(s)

DICHIARA, ROBERT A.

Examiner

Michael Barr

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 9-14, 26-36 and 39-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-14, 26-36 and 39-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/3/03, 3/19/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/19/2004 has been entered.

### ***Response to Arguments***

2. Applicant's arguments and amendments, filed 3/19/2004, have been fully considered and reviewed by the examiner. The examiner acknowledges the cancellation of Claims 37-38 and the addition of Claims 41-42. Claims 9-14, 26-36, and 39-42 are pending.

The applicant has argued that the references do not teach the invention as a whole, as the references do not teach or recognize the unexpected improvements (i.e. improved temperature stability for the ceramic substrate) required by the claims. The examiner is not persuaded by the applicant's argument. The cited prior art does recognize and teach that the slurry and included emissivity agents provide improved thermal stability to the ceramic substrate, as is illustrated by Kourtides, and as set forth in the previous office action. Therefore, the prior does recognize the claimed improvements required by the claims. As indicated in the previous office actions, DiChiara does teach the inclusion of the emissivity modifying agents in the slurry applied to the ceramic substrate. DiChiara merely fails to teach that the emissivity modifying agent be a boron

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compound. The Kourtides reference is merely being applied by the examiner to show that it is known in the art that molybdenum disilicide, silicon carbide, silicon hexaboride, and silicon tetraboride are functionally equivalent as emissivity modifying agents for high temperature ceramics, such as those in DiChiara and Kourtides et al. One of ordinary skill in the art reviewing DiChiara and Kourtides would have found it obvious to substitute silicon hexaboride or silicon tetraboride for the molybdenum silicide in the slurry of DiChiara, with the expectation of providing the functionally equivalent emissivity modifying properties to the slurry, since it is suggested by Kourtides that such material are substantially functionally equivalent as emissivity modifying agents for high temperature ceramics. In regards to the argument that the combination would not be expected to yield improved results, a proper combination does not need to yield improved results, only the expected results. The use of conventional materials to perform their known functions in a conventional process is considered obvious (*In re Raner* 134 USPQ 343). Also, the substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (*Ex parte Novak* 16 USPQ 2d 2041). This shows that improvement is not required for motivation to combine references. In the present case, the combination of DiChiara and Kourtides is substituting conventional and equivalent emissivity modifying agents to perform their known conventional function and such a combination is obvious and such motivation is proper. Furthermore, contrary to the applicant's arguments, the combination of DiChiara and Kourtides would not only achieve the expected and equivalent results of DiChiara, but would also yield the same improvement in thermal stability to the ceramic substrate, as achieved by DiChiara. Therefore, it is the position of the examiner that the applicant's claimed required improvements are not

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unexpected, as it is recognized in the art that the use of the emissivity modifying agents of DiChiara and Kourtides provide the claimed protection improvements for the ceramic substrates. As such, the applicant's arguments that there is no recognition in the prior art that the boron containing compound achieves the improved results of producing a porous ceramic body stable to higher temperatures than a porous ceramic body produced without the boron containing compound or the properties of Claims 26, are not persuasive. Furthermore, as indicated in the previous office action, the applicant has failed to provide claims and evidence commensurate in scope, indicating the argued improvements. Evidence of unobviousness must be commensurate in scope with the claims (*In re Kulling* 14 USPQ 2d 1056, 1058). There is insufficient evidence to indicate unexpected results using materials commensurate in scope with the claims. The only evidence provided by the applicant is an example using specific slurring materials, including boron carbide, and specific substrate material. The claims are not such limited. Also, there is no indication that all materials within the breadth of the claims would yield the same results indicated by the provided examples in the specification. Furthermore, the applicant has not provided a convincing showing of unexpected results using the boron compound in the slurry. If anything, the applicants achieves the expected result, as Kourtides shows that the use of such emissivity agents, such as the boron compounds, achieve thermal stability to 3000 °F, as indicated above. Emissivity agents are known for providing heat resistance and protection to the ceramic and thus would be expected to provide the porous ceramic body with higher stability to higher temperatures than a porous ceramic body produced without the boron containing compound (emissivity agent). Also, the applicant's showing in the specification (Examples) are not sufficient to indicate unexpected results, as the examples are not commensurate in scope with

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the claims, as the examples use specific materials, while the claims are broad. There is insufficient evidence to indicate unexpected results using materials commensurate in scope with the claims. Therefore, the examiner is not persuaded by the applicant's arguments and is maintaining the use of the references as previously set forth.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 9-14, 26-33, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over DiChiara, Jr. et al. in view of Kourtides et al.

DiChiara, Jr. et al. and Kourtides et al. are applied here for the same reasons as given above and in paragraph 3 of the previous office action. In regards to Claim 42, Kourtides et al. teaches that a combination of emissivity modifying agents, including molybdenum disilicide, silicon carbide, silicon hexaboride, and silicon tetraboride, can be used (Abstract). Therefore, it would have been obvious to one skilled in the art to use any or all of molybdenum disilicide, silicon carbide, silicon hexaboride, and silicon tetraboride, as the emissivity modifying agent in the slurry of DiChiara, Jr. et al., with the expectation of providing the desired and expected results, as Kourtides et al. teaches that any combination of molybdenum disilicide, silicon carbide, silicon hexaboride, and silicon tetraboride would be expected to yield the desired emissivity modification.

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5. Claims 34-36, 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over DiChiara, Jr. et al. in view of Kourtides et al. and Baker et al.

DiChiara, Jr. et al., Kourtides et al., and Baker et al. are applied here for the same reasons as given above and in paragraph 4 of the previous office action. In regards to Claim 41, DiChiara, Jr. et al. teaches that the slurry includes silica, cordierite, water, and an emissivity modifying agent (Col. 4, line 48-Col. 5, line 38). It would have been obvious to one skilled in the art to use boron carbide, as the emissivity modifying agent in the slurry of DiChiara, Jr. et al., in light of the Kourtides et al. and Baker et al. references, for the reasons set forth above and in the previous office actions.

***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Barr whose telephone number is 571-272-1414. The examiner can normally be reached on Monday-Thursday 6:00 am-3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on 571-272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael Barr  
Primary Examiner  
Art Unit 1762



MB  
April 7, 2004